

HELLENIC REPUBLIC

Report on EMF activities **10th International Advisory Committee meeting** **June 2005**

Research

In Greece, research in the fields of biological effects, dosimetry, and exposure assessment to EMF is performed in universities and research centers. Corresponding results by several groups are published in scientific magazines and presented in conferences, some of which are organized in Greece. The research programs are within the framework of either international collaborations which are funded from the European Union or other International sources, or smaller local collaborations funded from the Greek government. The research topics can be divided in the following categories:

- Epidemiological Studies
- Studies on biological systems
- Engineering studies
- Field measurements and monitoring of electromagnetic radiation

Legislation

Greece has implemented legally binding measures for the protection of the general public from exposure to electromagnetic fields by putting into force two national legislative acts concerning low frequency electric and magnetic field sources and all kinds of land-based antenna stations, entitled:

- a) "Protection measures for the exposure of the general public to all land based antenna stations" (Act No.1105/Vol. B/6-9-2000), Common Ministerial Decision of the Ministries of a) Development, b) Transport and Communications, c) Health and Welfare and d) Environment, Physical Planning and Public Works.
- b) "Protection measures for the exposure of the general public to all low frequency electric and magnetic fields emitting devices" (Act No.512/Vol.B/25-4-2002), Common Ministerial Decision of the Ministries of a) Development, b) Health and Welfare and c) Environment, Physical Planning and Public Works.

In these new legislative acts, the basic restrictions and the reference levels set in the Council Recommendation (1999/519/EC) concerning the frequency range of 0 Hz - 300 GHz, have been implemented. In the case of antenna stations however, the Greek legislation applied additional safety parameters to the allowed EMF-exposure levels. Hence, the safety limits for the exposure of the general public to all land based antenna installations are set to 80% of the reference levels while in the case of extremely low frequency fields the exact reference levels were set as the safety limits.

The competent national authority for the protection of the general public and the environment against artificially produced non-ionising radiation is the Greek Atomic Energy Commission (GAEC), which lies under the Ministry of Development. However measurements in antenna stations according to the legislation may also be performed by the Ministry for the Environment, Physical Planning and Public Works, the Ministry of Health and Welfare and the Ministry of Transport and Communications, or other authorized by the GAEC laboratories.

In the immediate future, there are plans to introduce some new regulations to take care of problems which occurred during the last few years of application of legislation acts described above.

Public concern

The Greek public is very sensitive and interested in the subject of EMF radiation. The main issues of concern to Greek people appear to be the health effects from the radiation of mobile telephony base aerials, the use of mobile telephones and the high voltage transfer lines. It should be noted however that almost any other source of radiation also attract the interest of the Greek public including microwave ovens, computer screens, televisions etc.

A fact that creates more problems to the people's understanding of the EMF phenomena and fuels their reactions against such installations are the frequently refuted and publicized research results and their inconsistencies. The responsible state authorities and scientists offer their help whenever this is asked either by individuals or the local authorities, but nevertheless the problem remains.

Public information activities

The Greek people can get information on the various aspects of the Electromagnetic radiation from several sources. These are:

- Web sites.
- Booklets and pamphlets.
- Publications in newspapers and wide circulation magazines.
- Discussions organized in Radio or TV programs.
- Talks, seminars and conferences addressed to special audiences, mainly school students and teachers.

Angelos Angelopoulos
Associate Professor
Faculty of Physics, University of Athens

Hellenic Republic

A draft list of research activities and publications on EMF radiation

A. Publications

1. Suggestion of concomitant changes of electric power consumption and childhood leukemia in Greece. E. Petridou, C-C Hsikeh, Y. Skalkidis, N. Toupadaki, Y. Athanasopoulos. Scand J Soc Med, 1993, 21:281-285
2. Need for a european approach to the effects of extremely low-frequency electromagnetic fields on cancer by ELF-EMF European Feasibility Study Group. Scand J Work Environ Health, 1997, 23:5-14.
3. Electrical power lines and childhood leukemia: a study from Greece. E. Petridou, D. Trichopoulos, A. Kravaritis, A. Pourtsidis, M. Koveginas, N. Dessypris, Y. Skalkidis, V. Kalapothaki and the childhood hematologists oncologists group. Int J Cancer, 1997, 73: 345-348.
4. Effect of GSM 900-MHz Mobile Phone Radiation on the reproductive Capacity of Drosophila melanogaster, D. J. Panagopoulos, A. Karabarbounis, L. Margaritis, Electromagnetic Biology and Medicine V23(2004)29-43
5. Mechanism for action of electromagnetic fields on cells, D. Panagopoulos, A. Karabarbounis, L. Margaritis, Biochemical and Biophysical Research Communications 298(2002)95-102
6. Effects of mobile telephony radiation on living organisms. A review of experimental and epidemiological studies. Suggestions for reducing the risk, Panagopoulos D. J., Margaritis L. H., Hellenic Society for Biological Sciences, proceedings of 27th Scientific Conference, Nafplio, May 2005.
7. Comparative effects of GSM 900 MHz and DCS 1800 MHz mobile phone radiation on the reproductive capacity of the insect Drosophila Melanogaster, Panagopoulos D. J., Chavdoula E., Pasiou E. and Margaritis L.H., Hellenic Society for Biological Sciences, proceedings of 27th Scientific Conference, Nafplio, May 2005.
8. "Accurate measurements and modeling of interaction between the human head and the mobile handset", T. ZERVOS, A.A. ALEXANDRIDIS, V.V. PETROVIĆ, K. DANGAKIS, B.M. KOLUNDŽIJA, D. OLĆAN, A.R. ĐORĐEVIĆ, C. SORAS, 7th WSEAS International Conference on Communications, July 2003, Corfu, Greece
9. "Dependence of the EM power absorbed in the head of a mobile phone user on the phone-head distance", T. Zervos, A.A. Alexandridis, V.V. Petrović, K. Dangakis, B.M. Kolundžija, A.R. Đorđević, C. Soras, , International Symposium on Electromagnetic Theory, Pisa, Italy, 23-27 May 2004
10. "Mobile handset radiation efficiency as a function of the antenna position relative to the human head", T. ZERVOS, A.A. ALEXANDRIDIS, V.V. PETROVIĆ, K. DANGAKIS, B.M.

KOLUNDŽIJA, A.R. ĐORĐEVIĆ, C. SORAS, 8th WSEAS International Conference on Communications, July 12-13, 2004, Athens, Greece.

11. "Accurate modeling and measurements of a mobile handset EM radiation", A.A. ALEXANDRIDIS, V.V. PETROVIĆ, K. DANGAKIS, B.M. KOLUNDŽIJA, P. KOSTARAKIS, M. NIKOLIĆ, T. ZERVOS, A.R. ĐORĐEVIĆ, 2nd International Workshop on Biological Effects of Electromagnetic Fields, October 2002, Rhodes, Greece.
12. "Comparison between helical and monopole antennas regarding mobile handset and human head interaction", T. ZERVOS, A.A. ALEXANDRIDIS, V.V. PETROVIĆ, K. DANGAKIS, B.M. KOLUNDŽIJA, A.R. ĐORĐEVIĆ, C. SORAS, Proc. of 3rd International Workshop on Biological effects of Electromagnetic Fields, pp. 239-243, October 2004, Kos, Greece.
13. "Measurements of interaction between a GSM handset helical antenna and user's head", A. ALEXIOU, T. ZERVOS, A.A. ALEXANDRIDIS, K. DANGAKIS, V.V. PETROVIĆ, P. KOSTARAKIS, C. SORAS, Proc. of 3rd International Workshop on Biological effects of Electromagnetic Fields, pp. 87-92, October 2004, Kos, Greece.

B. Research projects

Project title	Project acronym	Starting date (duration)	Greek participants
IN VIVO RESEARCH ON POSSIBLE HEALTH EFFECTS RELATED TO MOBILE TELEPHONES AND BASE STATIONS (Carcinogenicity Studies in Rodents)	PERFORM-A	1 March 2000 (60 months)	Aristotle University of Thessaloniki, Radiocommunications Laboratory
POTENTIAL ADVERSE EFFECTS OF GSM CELLULAR PHONES ON HEARING	GUARD	1 January 2002 (36 months)	District General Hospital of Thessaloniki AHEPA
PROJECT FOR SYSTEMATIC MEASUREMENTS AND MONITORING OF THE ELECTROMAGNETIC RADIATION	HERMES	29 November 2002 (ongoing)	1. Nat. Tech. Univ. of Athens, Mobile Radiocommunications Laboratory 2. Aristotle University of Thessaloniki, Radiocommunications Laboratory
BESTIMMUNG DER EXPOSITIONSVERTEILUNG VON HF FELDERN IM MENSCHLICHEN KÖRPER, UNTER BERÜCKSICHTIGUNG KLEINER STRUKTUREN UND THERMOPHYSIOLOGISCH RELEVANTER PARAMETER		11 November 2003 (24 months)	Aristotle University of Thessaloniki, Radiocommunications Laboratory

ELECTROMAGNETIC RADIATION MEASUREMENTS IN CITIES OF CENTRAL MACEDONIA AND THRACE		14 May 2003	Aristotle University of Thessaloniki, Radiocommunications Laboratory
		(ongoing)	
DEVELOPMENT OF PROCEDURES FOR ASSESSING ELECTROMAGNETIC EXPOSURE FROM BODY-MOUNTED WEARABLE & PORTABLE TELECOM EQUIPMENT	SARSYS-BWP	16 June 2003	Aristotle University of Thessaloniki, Radiocommunications Laboratory
		(24 months)	
ASSESSING HUMAN EXPOSURE TO ELECTROMAGNETIC RADIATION OF BASE STATIONS	BASEXPO	1 October 2003	Aristotle University of Thessaloniki, Radiocommunications Laboratory
		(24 months)	
INTEGRATED COMPUTATIONAL AND EXPERIMENTAL STUDY OF EFFECTS ON HUMANS FROM THE RADIATION OF CONTEMPORARY WIRELESS SYSTEMS		1 June 2002	Aristotle University of Thessaloniki Radar and Microwaves Unit
		(36 months)	